GLOBAL JOURNAL OF BIO-SCIENCE AND BIOTECHNOLOGY

www.scienceandnature.org

Short Communication

THE INSECT DIVERSITY OF RIVER KUNDA KHARGONE DISTRICT M.P. (INDIA)

Sudha Dubey[1], Shailendra Sharma[2], Rajendra Chaurasia[1]
[1]Department of Zoology, Govt. Holkar Science College Indore- 452017, India.
[2]Department of Biotechnology, Adarsh Institute of Management & Science Dhamnod (M.P.) India.

ABSTRACT
Limnological studies on various stations of Kunda River were carried out from August-2010 to January-2011. The present investigation was carried out to enumerate the Insect biodiversity of throughout various stations of Kunda River. During present investigation, 10 species comprising of 5 families were recorded including Baetidae, Caenoidae, Ephemeridae, Heptageniidae and Chironomidae. The dominant family was Chironomidae of which Chaoborus sp. was the most common species. Chaoborus sp. was also recorded in dominance in all the sampling station. The presence of pollution-tolerant Benthic macro-invertebrate such as Chironomus sp., Chaoborus sp. could be attributed to the effect of domestic and industrial wastes in the river.

KEY WORDS: Insect nymphs, Kunda River, Water quality, Biodiversity *etc*.

INTRODUCTION

The Kunda River is a Main river of Khargone district. It is a tributary river of Narmada river. It is originated from forest, Amba and Sirvel village. River Kunda has a length of approximately 169Kms. and its catchment area of 3825 sq. km. This river is situated in the west directions of M.P. and it flows from South to North through four block of Khargone district Bhagwanpura, Goganwa, Khargone, and Kasrawad. On the Kunda River there are two Dams constructed Dejla-Devada dam & Vanihar dam. Its Latitude 21º49'16" N and Longitude 75º36'4"E. Kunda River is rich in aquatic Insects biodiversity but due to increase in the pollution, the biodiversity of this river goes down day by day and we are losing one species every year. The Ephemeroptera (May fly) is one of the important order of insects which are true ballerinas of insect world. Ephemeroptera Nymphs are highly susceptible to pollution and thus are important indicators of water quality. Ephemeropterians requires high quality water for their existence. Thus biologists have used their presence or absence in coordination with the numbers present at particular location in a stream or river, to develop several indices of water quality. There are about 3000 species within 37 families in this order (Brittain and Sartori, 2003). The immature forms of Ephemeroptera are aquatic and the greater diversity of Ephemeroptera is found in warm rivers and streams. Adult Mayflies do not feed and live only from 1-2 hours to 14 days (Elliott and Humpesch, 1983). Ephemeroptera are hemimetabolous and are often multivoltine or semivoltine, although in temperate regions univoltinism is predominant. Ephemeroptera are important fish food items in all of their life stages nymphs, subimagos and imagos.

MATERIAL AND METHODS

Macro benthos (Insects) study was carried out for a period of six months from Aug. 2010 to January 2011 at various sites of Kunda River. The Insects samples were collected with surber sampler (at shallow profundal zone) following Wetzel (1971) and with hand net. Samples were preserved in 10% alcohol solution. Samples were returned back to laboratory and later sorted and picked up using low power scanning lens. Information regarding their habitat, vegetation, topography of the area was also recorded. The identification of Insects was done as per the methods of Nidham and Nidham (1998), Pennak (1989), Tonapti (1980) and Welch (1998) APHA (2002).

RESULT & DISCUSSION

The distribution has been reported to be dependent on the availability and distribution of preferably food in fact their capacity to exploit areas with optimum food supply might be explained by their abundance. During the present investigation carried out at various sites for Insects, 10 species comprising of 5 families were recorded Baetidae, Caenoidae, Ephemeridae, Heptageniidae and Chironomidae.

List of species collected from the sampling station

Name of Families	Species
Baetidae	Baetiella ladakae
	Baetis solangensis
	Baetis simplex
	Baetis festivus
Caenidae	Caehis sp.
Ephemeridae	Ephemera nadinac
Heptageniidae	Epeorus sp.
	Heptagenia nubile
Chironomidae	Chironomus sp.
	Chaoborus sp.

The river's environmental factors had directly and/or indirectly affected macro-invertebrates assemblages, showing that macro-invertebrates were useful indicators of water quality in Kunda River. A remarkable variety and abundance of macro-invertebrates were recorded from the Kunda River with the Phylum Arthropoda insects (class-Hexapoda, Order-Ephemeroptera and Order-Diptera). However there were signs of deterioration of the river's water quality. The abundance of less- sensitive organism such as Caenoidae and Heptagenidae, However, there were few pollution- sensitive (*i.e*., Ephemeridae, Chironomidae), and some moderately-sensitive families (*i.e*. Heptageniidae, Baetidae). The population density of living organisms in aquatic environment usually various with the variation of environmental parameters. The dominant family was Chironomidae of which Chaoborus species was the most common species. Chaoborus species was also recorded in dominance at all sampling sites. But their maximum population was recorded in the station like Confluence with Undri River. In the present study heavy pollution load was observed during raining months. However the maximum population of Dipterians was observed from October to January. Many May fly species especially among the Baetidae, display considerable life cycle plasticity, being able to change the number of generations per year in response to changes in temperature. If present which might have washed away the sediments, nutrients and the bottom appeared to be sand instead of usual organic mud of soft clay of texture. Micheal (1968), Dutta and Malhotra (1986) and Malhotra *et al.* (1996) reported the positive correlation between Ephemeroptera and temperature. The prevalence of the Baetidae in the Afro tropical fauna was emphasised by Edmunds (1972) and Wolda & Flowers (1985) discussed the relative diversity of tropical Ephemeroptera compared with those from temperate climates. The presence of pollution-tolerant Benthic macro-invertebrate such as Chironomus sp., Chaoborus sp. could be attributed to the effect of domestic and industrial wastes in the river. The low DO and high BOD values recorded in the present study may have favour the presence of these pollution indicator species. The adaptations of Chironomus sp. include possession of pigment hemoglobin which gives it a high affinity for oxygen (Mason, 1981), hence their tolerance of low DO. These are characteristic species in water showing some degree of change due to anthropogenic activities in the river.

ACKNOWLEDGEMENTS

We are thankful to Dr. R.K. Tugnawat, Principal Govt. Holkar Science College, Indore, for providing necessary laboratory facilities and encouragement.

REFERENCES

APHA (2002) Standard method for examination of water and waste water, American Public Health Association Inc. New York 22nd Ed.

Brittain, J.E. and M. Sartori (2003) Ephemeroptera (Mayflies). pp 373-380 in V.H.resh and R.carde, editors, encyclopedia of insects. Academic Press, Boston, U.S.A.

Dutta S., Y. R. Malhotra (1986) Seasonal variations in the macro-benthic fauna of Gadigarh stream (Miran Sahib), jammu. Indian J. Ecol. 13: 138-145pp.

Edmunds, G. F. Jr. (1972) Biogeography and evolution of Ephemeroptera. Annual Review of Entomology 17, 21-42pp.

Elliot, J.M., and U.H. Humpsech. (1983) A key to the adults of the British Ephemeroptera. British Biological Association; Cumbria.

Malhotra YR, KK Sharma, MR Thakial (1996) Ecology of macro-invertebrates from a fish pond. Pro. Nat. Acad. Sci. India 66: 53-59pp.

Michael RG (1968) Studies on bottom fauna in a tropical freshwater pond. Hydrobiol. 31:203-230.

Mason, C. F. (1991) Biology of Freshwater Pollution. Longman Scientific Technical, New York, USA. 350pp.

Nidham J. C. & P.R. Nidham (1998) A Guide to the study of fresh water biology. Reiter's Scientific and Professional books. Washinton, D.C.

Pennak, R. W., John Wiley and Sons (1989) Fresh-water invertebrates of the United States: Protozoa to Mollusca. 3rd. Ed. New York, USA; 769pp.

Tonapi, G.T. (1980) Fresh water animals of India-an Ecological approach. Oxford and IBH Publishing Co. New Delhi; 341pp.

Welch, P.S. (1998) Limnological methods McGraw Hills Book. Company, New York. 381 pp.

Wetzel, R.G. and Likens, G.E. (1971) Limnological Analysis 2nd ed. Sprihger-Verluag New York.

Wolda, H. & Flowers, R. W. (1985) Seasonality and diversity of mayfly adults (Ephemeroptera) in a "non-seasonal" tropical environment. Biotropica 17,330-335pp.